

# Briefing Document

A report that summarizes watershed water quality conditions with an orientation to identifying problems and seeking solutions

**Goal:**

- Consolidate/Interpret available information and data regarding the status of pollutants in the San Juan watershed
- Produce “briefing” report formatted to facilitate use for considering management actions
  - GAO style: fairly high level
  - Expressed in a way to support management focus
  - Series of appendices to support more detailed discussion where needed

**Approach:**

- Focus/organization: By pollutant: metals, sediment, nutrients, e. coli
- Endpoint: Highlight particular problems that may or may not be amenable to solution
- Resources:
  - Current SJ monitoring data
  - WINN supported project reports
  - Existing data to the extent it fills in gaps
  - Previous reports “ “ “ “ “ “

## **Briefing Document Orientation**

- **How does the pollutant work at the watershed scale?**
- **Is the pollutant influenced by flow, underlying geology, location?**
- **Does the pollutant have an impact on the quality of water and how it can be used?**
  - Hotspots
    - Location
    - Persistence
    - Time of year
  - Fate of Pollutant (sinks)
- **Can something be done about it? (Gaps and challenges to converting knowledge into actions)**

### **CHALLENGES FOR ME**

**Arrive at reasonable generalizations—there will be an exception to every one**

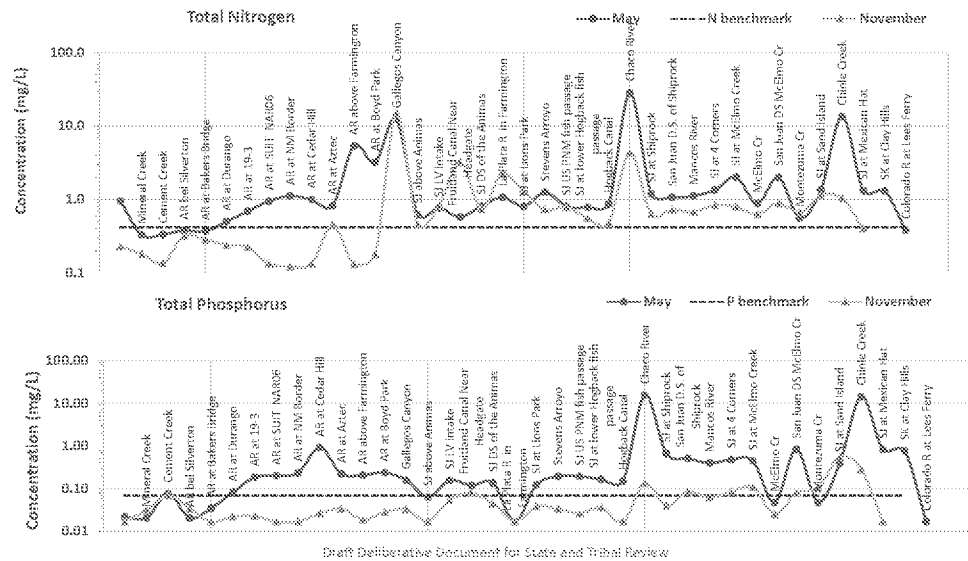
**Summarize: the complexity and detail possible with existing information is staggering—easy to get lost in it**

**Today: I will share some impressions on a few of the topics, but none are complete.**

## **Data Establishes What Issues?**

- **Nutrients are relatively high in the lower Animas and San Juan Rivers for much of the year that we sampled—local hotspots at San Juan tributaries**
- **Sediment loads are episodically high in the San Juan River and its tributaries, and are a significant source of metals in the water column during rain events and to Lake Powell.**
  - Sediment itself can be an issue for aquatic life
  - Source of metals
  - Important to Lake Powell

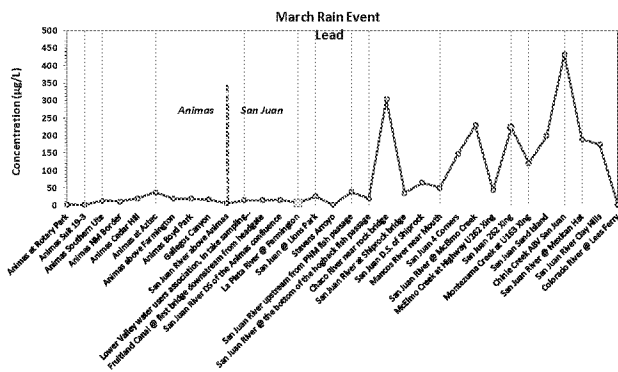
## Nutrients—May and November Sampling



## **Data Establishes What Issues?**

- **Total metals respond to flow differently in parts of the basin dominated by rainfall (San Juan) or snowmelt runoff (Animas).**
- **Snowmelt runoff generally elevates metals concentrations throughout the river system, though most do not exceed wq benchmarks**
- **Rainstorms produce dissolved and total concentrations in the San Juan River that can surpass anything observed during snowmelt, but typically for much shorter duration**
- **Not all metals of concern are associated with the mining district**
- **Not yet identified any specific hotspots with persistent trends outside the Animas mining district, but Chaco and Chinle are important contributors of sediment, metals, and nutrients to the San Juan**



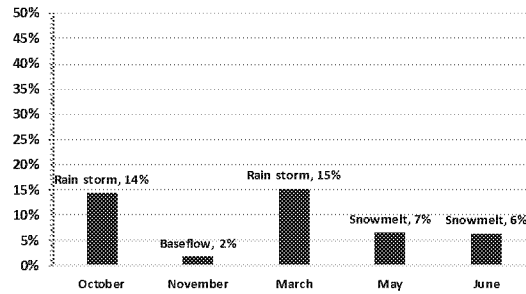


The March 2019 sampling captured a rainfall event in the middle and lower San Juan

--So far, no persistent hot spots defined by exceeding benchmarks outside of Upper Animas mining district

--Most metals are exceeded for some use at some time  
 --Criteria are most frequently exceeded during rain events

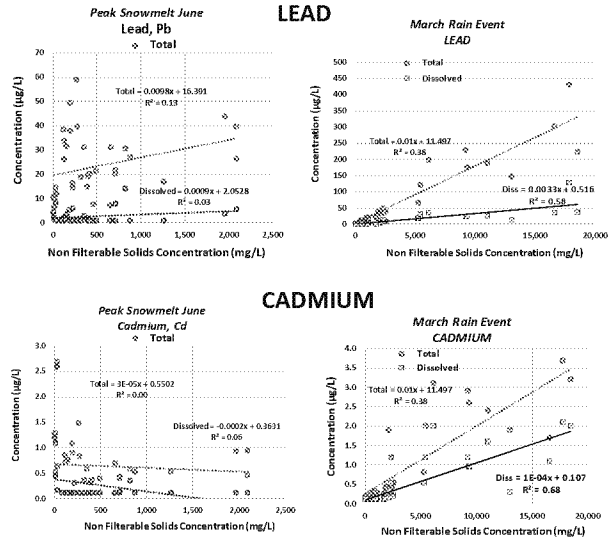
Exceedances by Sample Date





## Dissolved and Total Metals in Relation to Flow and/or Sediment Characteristics

- The total fraction of many metals is responsive to flow and/or sediment characteristics
- Dissolved metals are not well correlated with flow and/or sediment characteristics for purposes of prediction.
- USGS equations based on sonde data pretty good for some metals in some locations
- Rainstorms are different than snowmelt when it comes to the dissolved fraction
- The variability associated with rain storms hampers prediction



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**Percentage of Comparisons**

**LEAD**  
Almost 50% of the exceedances occurred during the March sampling, impacting primarily the San Juan and tributaries, multiple uses

**n = 18,399**

Element	Percentage of Comparisons
Al	41%
Fe	22%
Hg	18%
Pb	17%
Mn	11%
Cr	11%
Th	6%
Ba	5%
Be	5%
Se	3%
V	3%
Cs	2%
Cd	2%
Ni	1%
Co	1%
Zn	1%
Ag	1%
Cu	0%
Sb	0%
ALL	7%

## MERCURY

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[illegible]

- 1) 2018 EPA guidance on AI
- 2) Potential new processing method (pH4)

## Agriculture

- Irrigation water is taken from multiple locations throughout the middle and lower Animas.
- Canals provide water to many agricultural users in the San Juan
- The New Mexico State University study determined no agricultural issues related to metals

- **DITCHES (more work to do)**

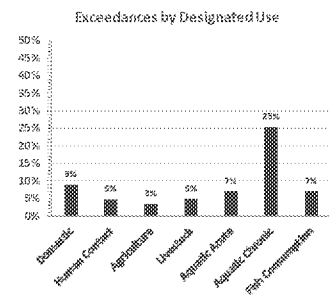
- Metals in water and sediments did not exceed screening criteria

- **SOILS**

- The soil concentrations of all elements of concern were below screening levels for residential risk scenarios except for arsenic which was slightly elevated.
  - Soils did not accumulate metals from the beginning to end of the irrigation season
  - Some interesting data showing local variability at the scale of a field or a ditch (side to bottom), but meaningful averages all did not show any significant patterns.

- **PLANTS**

- Metals in grass and alfalfa and other crops were below screening levels



**SJ Monitoring  
found occasional  
exceedances of  
criteria**